the personality has its origin in the eye is most probable, as in all the observations used in this investigation the transits were recorded automatically on the chronograph.*

Kenwyn, Kidbrooke Park Road,
Blackheath, 1874, Dec. 10.

* Dr. Robinson has remarked, in the Introduction to the *Armagh Catalogue*, on the existence of a variable personal equation in observing transits of the first and second limbs of the Moon, and he has given examples of the effect of this personality, by comparing the difference of longitude, determined by the method of Moon-culminating stars, between Armagh and the Observatories of Greenwich, Dublin, Cambridge, Königsberg, and Paris, as found from observations of the first and second limbs of the Moon. His discordances between the separate results are great, but the number of observations is generally far too small to obtain a trustworthy determination. Dr. Robinson concludes that these personal differences are owing solely to irradiation, the origin of which is in the eye. He has, from experiment, found that the irradiation of the limb is diminished considerably by strongly illuminating the field of view; and, by reducing the aperture of the object-glass by a semi-transparent diaphragm of oiled paper, which should fill the field with scattered light, he has very largely reduced the error in the Sun's observed diameter produced by irradiation.

Phenomena of Jupiter's Satellites, observed at Mr. E. Crossley's Observatory, Bermerside, Halifax, with a 9½-inch Equatoreal Refractor by Cooke.

By Mr. Joseph Gledhill, F.R.A.S., F.G.S. etc.

Date. 1873.	Satellite.	Phenomenon.	G.M.T. h m s	Remarks.
May 6	I.	Sh. I. int. contact	8 32 20	Considerable motion; not a good obs.
		Tr. E. int. contact	9 31 3·5	Bad definition; not good observations.
		bisection	9 33 2·3	
		ext. contact	9 34 30	
May 9	II.	Tr. I. ext. contact	8 57 0·5	The first and last are the best.
		bisection	8 59 30·4	
		int. contact	9 1 0·8	
May 11	II.	Ec. R. first seen	9 29 6·2	Good.
		fully bright	9 31 0	Pretty good.
May 12	I.	Occ. D.	11 49 0	Quite gone; cloud prevented a good view.
May 13	I.	Tr. I. ext. contact	9 9 0	Good.
		bisection	9 11 3·5	Pretty fair.
		int. contact	9 12 6·3	Good.
	I.	Sh. I. int. contact	10 28 4	Pretty fair observation.
	I.	Tr. E. ext. contact	11 30 30	Planet low; definition bad.
May 14	I.	Ec. R. first seen	9 51 15·5	Good.
		fully bright	9 53 5	Fair.

Date. 1873.	Satellite.	Phenomenon.	G.M.T. h m s	Remarks.
May 21	I.	Occ. D. first contact	8 11 30·4	Fair.
		bisection	8 13 30	Pretty good.
		disappeared	8 15 0	Good.
	III.	Sh. E. just off	8 50 0	Definition not good; obs. difficult.
May 22	I.	Tr. E. int. contact	7 50 0	Not Good.
		ext. contact	7 53 30	Good.
	I.	Sh. E. last seen	9 8 0	Bad definition; uncertain obs.
May 24	IV.	Ec. R. first seen	10 47 3·2	Good.
		fully bright	10 49 0	Uncertain.
June 6	I.	Ec. R. first seen	10 5 35	Good.
		fully bright	10 7 35	Uncertain.
1874.				
Feb. 19	II.	Ec. D. began to fade	13 42 0	Pretty good.
		disappeared	13 44 46	Good.
Mar. 7	III.	Ec. D. fading away	10 22 0	Uncertain.
		disappeared	10 25 1	Good.
Mar. 9	I.	Ec. D. fading	9 52 0	Uncertain; very bad night.
		fading fast	9 53 0	
		disappeared	9 54 5	Good.
	II.	Occ. R. first seen	11 12 30	Pretty good.
		ext. contact	11 40 30	Fair; bad definition.
	I.	Occ. R. first seen	12 16 15	Observations not good; boiling.
		ext. contact	12 19 30	
Mar. 10	I.	Sh. E. first contact	9 17 10·3	Definition very bad.
		bisection	9 18 2·7	
		last contact	9 20 5	
	I.	Tr. E. first contact	9 25 5·3	The last observation is the best; the definition is very bad indeed.
		bisection	9 26 2·7	
		last contact	9 30 3	
Mar. 18	II.	Tr. E. int. contact	7 59 0	Violent boiling; obs. not good.
		bisection	8 2 7·5	Not good.
		ext. contact	8 5 3·5	Pretty fair.
	I.	Occ. R. last contact	8 28 30	Fair.
Mar. 24	I.	Tr. I. first contact	10 41 1·3	Not so good.
		bisection	10 43 0	Not so good.
		last contact	10 45 5·5	Pretty good.
	I.	Sh. I. bisection	10 55 0	Difficult, owing to motion.
		int. contact	10 55 30	
	I.	Tr. E. first contact	12 55 3·5	Pretty good.
		bisection	12 57 0	Uncertain.
		last contact	12 58 2·5	Fair.

Date. 1874.	Satellite.	Phenomenon.	G.M.T. h m s	Remarks.
	I.	Sh. E. first contact	13 7 3·2	Fair.
		last contact	13 9 5·4	Fair.
Mar. 25	III.	Tr. I. first contact	7 18 0	Fair.
		bisection	7 21 3	Pretty good.
		int. contact	7 25 5	Pretty good.
	II.	Tr. I. first contact	7 41 40	Very fair.
		bisection	7 43 30	Very fair.
		int. contact	7 45 0	Very fair.
	I.	Occ. D. first contact	7 54 0	Much motion; fair observations. Observed by Mr. Crossley.
		bisection	7 55 0	
		disappeared	7 58 0	
	II.	Sh. I. bisection	8 4 0	Fair. Observed by Mr. Crossley.
		int. contact	8 5 30	Fair
	II.	Sh. E. first contact	10 37 10	Much boiling just now.
		bisection	10 39 45	
		last contact	10 42 0	
	III.	Sh. E. first contact	11 7 0	Pretty good. Observed by Mr. Crossley.
		bisection	11 11 30	Pretty good
		last contact	11 14 0	Pretty good
	II.	Tr. E. first contact	10 10 30	Uncertain.
		bisection	10 15 0	Not good.
		last contact	10 17 5	Fair.
	I.	Ec. R. first seen	10 20 40	Good.
		fully bright	10 22 30	Fair.
	III.	Tr. E. first contact	10 21 0	Bad, perhaps.
		last contact	10 24 30	Pretty good.
Mar. 31	I.	Tr. I. first contact	12 24 0	Good.
		bisection	12 27 0	Not so good.
		last contact	12 28 30	Good.
April 3	II.	Ec. R. first seen	7 57 51	Very good.
		still dim	7 59 36	Good.
		fully bright	8 1 36	Good, perhaps.
April 8	I.	Occ. D. first contact	11 22 40	Very fair.
		bisection	11 24 30	Good, perhaps.
		disappeared	11 26 40	Very good.
April 10	I.	Ec. R. first seen	8 37 40	Probably not very good; cloudy.
April 17	II.	Occ. D. first contact	9 7 0	Probably too early.
		bisection	9 9 5	Fair.
		disappeared	9 11 2·5	Pretty good.

Date. 1874.	Satellite.	Phenomenon.	G.M.T. h m s	Remarks.
	I.	Ec. R. first seen	10 31 0	Good.
		fully bright	10 34 0	Uncertain.
April 23	I.	Tr. I. first contact	12 10 0	Pretty good.
		bisection	12 12 0	Pretty good.
		last contact	12 13 30	Perhaps not good.
May 1	I.	Oc. D. first contact	11 9 30	Fair.
		bisection	11 11 0	Not reliable.
		disappeared	11 12 30	Good.
May 2	I.	Tr. I. first contact	8 26 3	Pretty good.
		bisection	8 28 5	Not reliable.
		int. contact	8 30 2	Very fair; cloudy.
	I.	Sh. I. bisection	9 25 0	Not good; too much cloud.
			9 27 0	Not good.
	I.	Tr. E. inner contact	10 41 0	Cloudy; uncertain.
		bisection	10 43 2	Cloudy; uncertain.
		ext. contact	10 44 5	Pretty good.
May 8	I.	Occ. D. first contact	12 58 0	Planet very low; bad definition.
		disappeared	13 0 0	Observation not good.
May 10	I.	Ec. R. first seen	10 44 30	An uncertain observation; cloudy
May 17	I.	Occ. D. first contact	9 15 1·5	Good.
		bisection	9 17 0	Uncertain.
		disappeared	9 18 30	Very good.
June 8	III.	Occ. D. first contact	8 49 0	Fairly good.
		bisection	8 54 0	Uncertain.
		disappeared	8 57 5	Very good.
June 10	I.	Tr. E. inner contact	8 54 0	Not good.
		bisection	8 56 0	Not good.
		last contact	8 58 30	Fairly good; possibly early.

On a New Astrometer. By E. B. Knobel, Esq.

Having been for some time engaged in a work which necessitates the determination of the relative magnitudes of Telescopic Stars, I have been led to devise the following contrivance for doing so.

It is a well-known fact that an equatoreal triangular aperture gives very good definition. Sir John Herschel says,* "The triangular aperture," or diaphragm, which admits the light

* *Cape Observations*, p. xvi.